

It is asserted that these amendments do not add new matter and are supported by the specification and claims as originally filed. Entry of these claims is respectfully requested.

REMARKS

Claims 12-19 have been rejected.

Claims 12-19 are cancelled.

New claims 20-28 have been filed.

Claims 20-28 are pending in the application.

New main claim 20 further comprises structural limitations in the preamble with the following features: "a low shrinking polymerizable or crosslinkable dental composition comprising a mixture of" and "...wherein the composition has a volumetric polymerization or crosslinking shrinkage of less than 1.5% v/v."

This limitation finds support in the instant application from page 1, line 21 to page 2, line 2 and in Example 4, from page 37 line 23, to page 34, line 2. Indeed, the instant claimed invention relates to a low shrinking polymerizable or crosslinkable dental composition and example 4 illustrates that if one of the components of the claimed composition is missing (in Example 4, the component (3)) the resulting composition exhibits a volumetric polymerization shrinkage of 3.5% after the crosslinking step compared to less than 1.5% to compositions according to the claimed invention.

Furthermore, Claim 20 further incorporates the limitation of prior claim 12:

- on the one hand, by merging it with prior claim 17, accepted by the examiner and stating a limited group of aromatic photosensitizers (2) of formulas (IV) to (XXII);
- or, on the other hand, with the content of the description, page 15, lines 4 11, and 12, which corresponds respectively to a specific groups of judiciously selected anionic borate entities and to a specific group of cationic entity, for the borate photoinitiator (4).

New claim 21 relates to a preferred group of photosensitizers (2) of formulas (IV), (VI), (VIII), (X), (XII).

New claims 22 to 24 correspond to prior claims 13 to 15.

New claim 25 corresponds to prior claim 17.

New claims 26, 27, 28 correspond to prior claims 16, 18, 19.

The objected claims 12-19 have been amended according to Examiner's suggestions.

The rejection of claims 12-19 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, is respectfully traversed and is addressed in light of the comments below.

Claim 20 (former claim 12) and claim 25 (former claim 17) have been amended to include proper Markush language as suggested by the Examiner.

For these reasons, Applicant respectfully requests that the Examiner now reconsider and withdraw the rejection of claims 12-19, under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 12-13 and 15-16 under 35 U.S.C. § 102 (b) as being anticipated by, or, in the alternative, under 35 U.S.C. § 103 (a) as being obvious over Priou et al. (U.S. Patent # 5,703,137), is respectfully traversed and is addressed in light of the comments below.

The technical problem which underlies the instant invention is to provide a low shrinking polymerizable and/or crosslinkable dental composition which :

- is polymerizable and/or crosslinkable in an oral environment, with initiator(s) fully active in an environment comprising a major part of dental filler which is radioopaque and thus which is not suited for polymerization/crosslinkage,
- does not exhibit use problems under irradiation,
- is not toxic,
- adheres enough to the dental supports, and, above all,
- is not subject to high volume shrinkage.

The dental composition according to new claim 20 actually solves this technical problem, by implementing particular functionalized silicones (1), specific photosensitizers (2) of formulas (IV) to (XXII), dental fillers (3) and selected borate-type photoinitiators (4).

Neither Priou, nor Weinmann nor Castellanos, taken alone or together, does describe or suggest this advantageous combination (1), (2), (3), (4) in view of:

- being efficient with high concentrations of dental filler, and
- significantly reducing volume shrinkage.

Priou et al do not care about high volume shrinkage of dental crosslinkable compositions, but rather cationically crosslinkable silicone for the production of anti-adhesive coatings (please see column 1, lines 40-42 of the Priou patent).

Priou et al teach a huge family of onium borate initiators, whereas borate type initiators (4) of new claim 20 are in finite number of $7 \times 12 = 84$.

Priou et al only discloses the **possibility** of the presence of one photosensitizer which can be **equally** toluene, pyridine, ferrocene, benzene, thioxanthane, anthracene, or benzophenone. However, there is none of these photosensitizer in the Priou et al examples.

In addition, Priou et al assert that the non dental composition **may** comprise various additives, and notably fumed silica among numerous others.

There is no suggestion whatsoever by Priou of implementing a dental filler present in a high quantity of at least 10% by weight (as claimed in new claimed 20), which is likely to hamper the action of the photoinitiator (and, eventually, of any photosensitizer).

The claimed dental composition of the instant invention **(1) (2) (3) (4)** are compulsory to reduce the volume shrinkage;

Furthermore, the unobvious association of **photosensitizer (2) & photoinitiator (4)** is also essential to obtain a good crosslinking.

Priou's examples rather encourage one skilled in the art to use a borate-type initiator with an accelerator, without any dental filler and without any photosensitizer.

For these reasons, Applicant respectfully requests that the Examiner now reconsider and withdraw the rejection of claims 12-13 and 15-16 under 35 U.S.C. § 102 (b) as being anticipated by, or, in the alternative, under 35 U.S.C. § 103 (a) as being obvious over Priou et al. (U.S. Patent # 5,703,137).

The rejection of claims 12-13 and 15-16 under 35 U.S.C. § 103 (a) as being obvious over Weinmann et al. (U.S. Patent # 6,245,828), in view of Castellanos et al. (U.S. Patent # 5,468,902), is respectfully traversed and is addressed in light of the comments below.

The dental polymerizable composition based of epoxides A and B, according to Weinmann et al, neither discloses nor suggests the claimed innovative selection of photosensitizer (2) and borate-type initiator (4).

(2) + (4) is one of the main features of the instant claimed invention, whereas Weinmann et al. teach how to reduce the volume shrinkage by means of the peculiar association of epoxides A and B.

Weinmann et al. composition also comprises initiators and retardants or accelerators (d). Said component (d) is disclosed in general. Weinmann et al. do not teach a particular group of initiators.

A variety of initiators are mentioned in column 17, lines 61-66 of the Weinmann patent. These initiators are phosphates, borates, antimonates. Borates are not preferred and are not used in the examples.

Moreover, none aromatic photosensitizer, and even less a photosensitizer (2) according to the instant invention, is disclosed in the Weinmann patent as being necessary, in combination with a borate (1), for the reduction of the volume shrinkage occurring during the cationic curing of epoxy-silicones.

It is quite unexpected to find out according to the invention, the extraordinary efficiency of the combination photosensitizer (2) + initiator (4) with respect to cationic curing with a reduction of the volume shrinkage.

It's all the more a amazing result that the reactional medium that forms the composition, contains a high concentration of radio-opaque dental filler. It means that it was to be feared that the be less efficient in such a medium.

Radio-opacity being required for the dental use, it is quite unexpected, to obtain a good curing under U.V. radiations.

Moreover, Weinmann et al teach the use of a photoinitiator (different from component (4) of claim 20) in combination with a peroxide accelerator (please see from column 17, line 66 to column 18, line 4 of the Weinmann patent). That peroxide accelerator has nothing to do with component (2) of claim 20.

In addition, the inventors have carried out a comparative example 1 wherein the photoinitiator P1 of example 1 of the instant specification is replaced with (η -6 cumene)(η -5 cyclopenta-dienyl)Fe⁺;PF₆⁻ (Irgacure® 261) used by Weinmann and more particularly in example 2 of his patent.

The outcome is that the composition according to comparative example 1 does not cure.

RN98131

Serial number 09/806,629

AMENDMENT

Examiner's objection according to which Castellanos et al could have taught to one skilled in the art, how to fill the gap existing between the content of Weinmann et al and the instant claimed invention, is respectfully traversed.

First of all, Castellanos et al. do not teach a dental composition having a reduced volume shrinkage.

Secondly, Castellanos et al. do not disclose the very particular borate-type initiator (4) of instant claim 20.

Thirdly, Castellanos et al neither describe nor suggest the implementation of specific photosensitizers (2) of formulas (IV), (VI), (VIII), (X), or (XII), in combination with the initiators (4) according to claim 20.

And, finally, the examiner is wrong when he asserts that for one skilled in the art, an accelerator (as mentioned by Weinmann et al.) is a photosensitizer.

The most compelling proof is that a definition of an accelerator in this context is given by Priou et al, wherein the accelerator is the main object of the Priou patent. Priou makes it clear that an accelerator is not a photosensitizer and even less the photosensitizer (2) according to the claimed dental composition.

Even if an accelerator is a photosensitizer (but it is not), Castellanos et al. neither describe nor suggest the implementation of specific photosensitizers (2) : formulas (IV), (VI), (VIII), (X), (XII) of the instant claimed dental composition.

For these reasons, Applicant respectfully requests that the Examiner now reconsider and withdraw the rejection of claims 12-13 and 15-16 under 35 U.S.C. § 103 (a) as

RN98131
Serial number 09/806,629
AMENDMENT

being obvious over Weinmann et al. (U.S. Patent # 6,245,828), in view of Castellanos et al (U.S. Patent # 5,468,902).

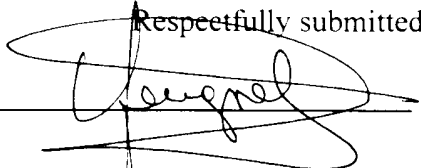
In view of the preceding remarks, it is asserted that the patent application is in condition for allowance. Should the Examiner have any question concerning these remarks that would further advance prosecution of the claims to allowance, the examiner is cordially invited to telephone the undersigned attorney at (609) 860-4180.

A notice of allowance is respectfully solicited.

January 02, 2003

Rhodia Inc.
259 Prospect Plains Road
CN7500
Cranbury, NJ 08512

Document3

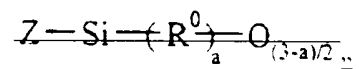
Respectfully submitted,
By 

Jean-Louis SEUGNET
Limited Recognition under 37 CFR §
10.9(b) enclosed.
Tel : (609) 860-4180
Fax: (609) 860-0503

Marked-Up Amended Specification

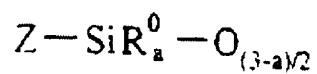
On page 2, lines 10-11, please cancel the following paragraph:

~~at least one unit of formula (FS):~~



and replace it with the new following paragraph:

- at least one unit of formula (FS):



--